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HIGH-SCHOOL COSTS

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Accurate cost-accounting lies at the foundation of all successful business management. In railroad administration, for example, it is known that under usual normal conditions locomotive repair-cost should average about six cents per mile-run; lubricating oils should cost about eighteen cents per hundred miles for passenger locomotives, and about twenty-five cents for freight locomotives; and so on for each item involved in the entire management. With these cost-standards at hand, derived from wide general practice, if a railroad manager finds at the end of the year that locomotive repairs average fifteen cents per mile-run, then it is quite evident upon the surface that something is wrong somewhere. The railroad is paying too high wages to labor; it is getting too little labor for the amount expended; its labor force is working under adverse conditions; there is graft in the repair department; or the entire outfit of locomotives is in a sad state of depreciation. When the cost runs so high above standard, something needs to be investigated, and either shown to be the result of unusual conditions, or corrected. If, on the other hand, the repair-cost is running at three cents per mile on an average, and if unusual conditions do not exist, then it appears probable

that locomotives are being left to depreciate too rapidly. Cost-accounting is thus seen to be one method of diagnosing the situation and locating irregularities of management.

In operating a high school, expenditures need to be made for many things—general administration, supervision, instruction, fuel, janitors, light, power, library, etc. For each of these, standard unit-costs are needed for judging the efficiency of the management. If it is known, for example, that satisfactory instruction in high-school English can be had for fifty dollars per thousand student-hours, and that this price represents the norm of practice, then those responsible for high-school management have a standard of judgment that can be used for measuring the efficiency of their practices. If instruction in this subject is costing them $75 per 1,000 student-hours, and they are aiming at results of only the usual sort, it is evident that they are wasting money, and that administrative adjustments need to be made. If they are getting this commodity for $30 per thousand student-hours, then it is probable that they are practicing so great an economy as seriously to injure the quality of the work.

There can be nothing final about such standards of practice; and they need to be set up anew each year. They afford a fact-basis of judgment, however, that is superior to mere arbitrary opinions as to what ought to be invested in the thing in question.

The present study deals with the single item of instruction. The figures here presented represent the results of a co-operative study undertaken by the superintendents or high-school principals of the cities and towns named in the tables and charts. The primary purpose of the study is to present a *method* of finding standards of practice and of comparing individual schools with such standards. The figures were furnished by many individuals. And owing to different methods of organization and of accounting in different schools, it is probable that the same basis is not always used. It is too much to hope, therefore, that the figures are always entirely accurate. They are moderately accurate for most of the cities—unfortunately not always—and roughly serve our major purpose of suggesting a method that ought to be currently used by co-operating groups of high schools.

MATHEMATICS

How much ought a community to be expected to pay for instruction in high-school algebra and geometry? Table I shows the actual prices paid for this commodity in twenty-five co-operating high schools. The cost-unit is the student-hour. This means the instruction of one student for one hour of sixty minutes. For purposes of representation and comparison there are several reasons for preferring the "cost per 1,000 student-hours." We have therefore used this number of cost-units in all of the tables and charts.

TABLE I

MATHEMATICS.—COST OF INSTRUCTION IN HIGH-SCHOOL MATHEMATICS PER 1,000 STUDENT-HOURS, 1913

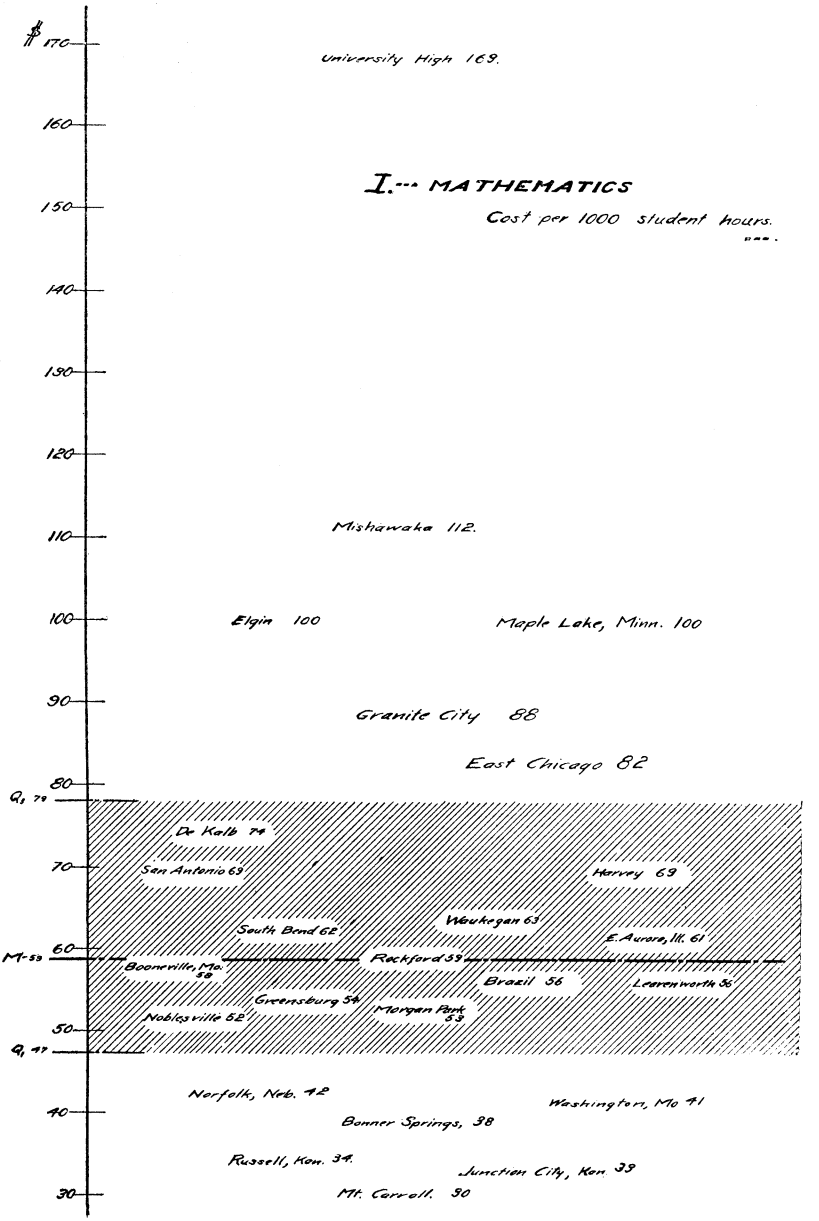
	Cost per 1,000 Student-Hours
University High	$169
Mishawaka, Ind	112
Elgin, Ill	100
Maple Lake, Minn	100
Granite City, Ill	88
East Chicago, Ind	82
DeKalb, Ill	74
San Antonio, Tex	69
Harvey, Ill	69
Waukegan, Ill	63
South Bend, Ind	62
East Aurora, Ill	61
Rockford, Ill	59
Booneville, Mo	58
Brazil, Ind	56
Leavenworth, Kan	56
Greensburg, Ind	54
Morgan Park, Ill	53
Noblesville, Ind	52
Norfolk, Neb	42
Washington, Mo	41
Bonner Springs, Kan	38
Russell, Kan	34
Junction City, Kan	33
Mt. Carroll, Ill	30

All but four of these schools are accredited by the North Central Association. They are all presumably attempting to secure similar results in mathematics. The actual results secured in the different high schools are probably not greatly different. Colleges estimate them as relatively equal in their entrance valuations. Yet one high school is getting these results for $30 per 1,000 student-hours, while another is paying more than five times as much. Looking only to public high schools, certain ones are paying more than three times as much. The University and the DeKalb high schools, by the way, are used for practice teaching and observation. They are therefore attempting something more than the usual public high school, and it is but natural that they should have to pay more for the additional results.

Fifty-nine dollars paid in Rockford is the median price paid for algebra and geometry. There is no reason to think that the results obtained in Rockford are in any degree inferior to those obtained in the dozen cities paying a higher price. Fifty-nine dollars for mathematics represents the consensus of practice and is a *safe* standard of judgment for high schools.

Such a standard of practice is too rigid for universal application. The diversity represented by the middle half of the cities is probably normal. The standard of practice should probably be so formulated as to permit the flexibility of practice found in this middle 50 per cent of cities. We can say, therefore, that between $52 and $74 is a safe standard price for high-school mathematics. This we shall call the "zone of safety." Those cities that fall below the lower limits of this central zone—presuming that we had a homogeneous class, which is in fact not here the case—are either overworking their teachers or underpaying them; or they may be doing both. The facts show either that the communities need to exert themselves somewhat more, or that the schools are in need of state aids so as to equalize effort in the different cities.

The tabular mode of presenting the facts is not so convincing to a community as a graphical one. In Chart I the median M and the "zone of safety" between the quartiles Q–I and Q–III show in spatial terms the safe levels for any city. The chart is particularly designed to show this exceptional standing of


$
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
Q, 79
M-59
Q, 47
University High 169.
I.--- MATHEMATICS
Cost per 1000 student hours.
Mishawaka 112.
Elgin 100
Maple Lake, Minn. 100
Granite City 88
East Chicago 82
De Kalb 74
San Antonio 63
Harvey 69
Waukegan 63
South Bend 62
E. Aurora, Ill. 61
Boonville, Mo. 58
Rockford 59
Brazil 56
Leavenworth 56
Greensburg 54
Morgan Park 53
Noblesville 52
Norfolk, Neb. 42
Washington, Mo 41
Bonner Springs, 38
Russell, Kan. 34.
Junction City, Kan 33
Mt. Carroll. 30

those that fall outside the "zone of safety," and the degree of such exceptionalness.

LATIN

Latin is another subject in which the aims, methods, and materials of the various high schools are relatively uniform. Not even in the mathematics has the content of the work been so thoroughly standardized; yet Table II shows that the diversity of prices paid for Latin instruction is very great. The price of Latin is much higher than that of mathematics; but still those who are paying most for it are expending four or five times as much per 1,000 student-hours as those who are paying least. The table shows rather clearly that, while we have been standardizing the content of the work and certain aspects of the teaching, we have not yet standardized the administrative aspects of the problem.

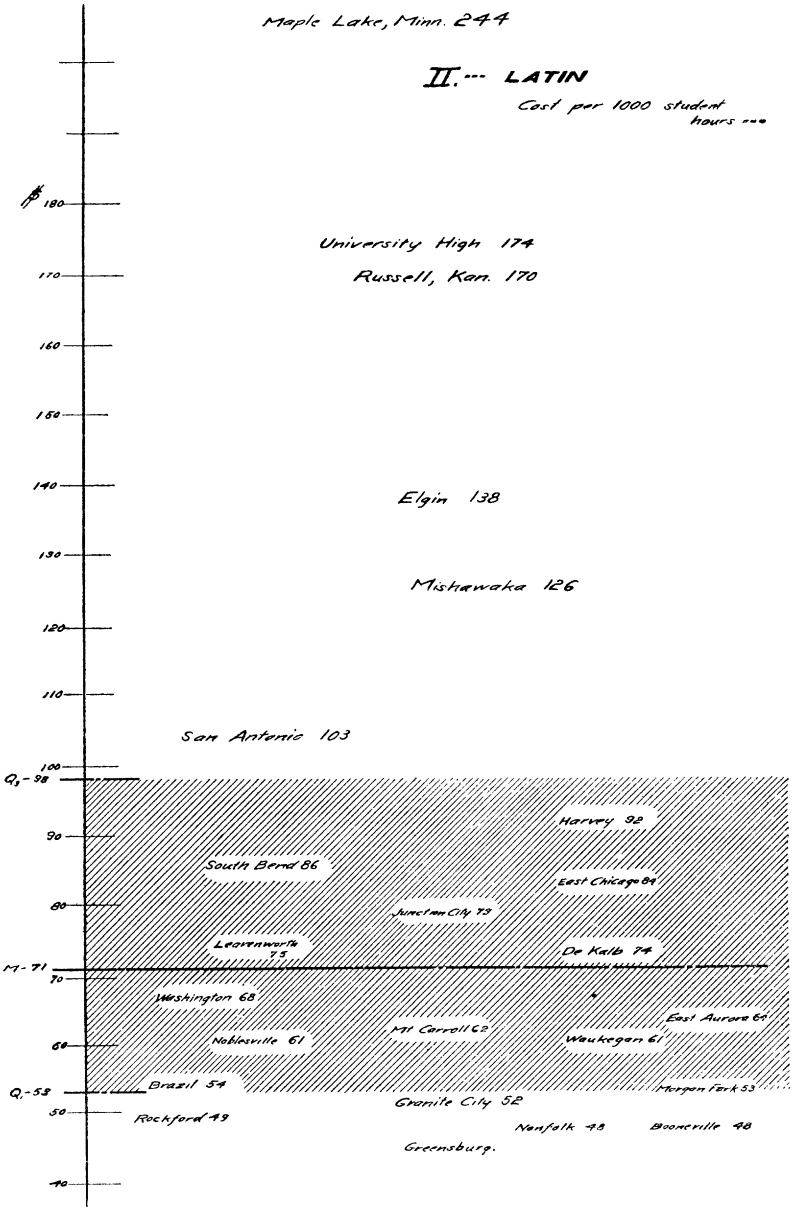
TABLE II

LATIN.—COST OF INSTRUCTION IN HIGH-SCHOOL LATIN PER 1,000 STUDENT-HOURS, 1913

	Cost per 1,000 Student-Hours
Maple Lake, Minn	$244
University High	174
Russell, Kan	170
Elgin, Ill	138
Mishawaka, Ind	126
San Antonio, Tex	103
Harvey, Ill	92
South Bend, Ind	86
East Chicago, Ind	84
Junction City, Kan	79
Leavenworth, Kan	75
DeKalb, Ill	74
Washington, Mo	68
East Aurora, Ill	64
Mt. Carroll, Ill	62
Waukegan, Ill	61
Noblesville, Ind	61
Brazil, Ind	54
Morgan Park, Ill	53
Granite City, Ill	52
Rockford, Ill	49
Norfolk, Neb	48
Booneville, Mo	48
Greensburg, Ind	46

Seventy-one dollars is the median cost of Latin instruction. This is a 20 per cent higher price than that paid for high-school mathematics. This cannot be due to the greater value of the subject, to any diminished supply of the commodity, or to higher salaries paid the teachers. It is simply due to administrative maladjustments in the teaching of the Latin on the side of size of classes and number of teaching-hours per week. It is interesting to observe the highly extravagant price paid by certain villages that really can least afford such wastefulness. Maple Lake is probably getting no more results for each 1,000 student-hours than is DeKalb at one-third the cost or Rockford at one-fifth of the cost. Practical men, before buying wheat, or cotton, or railroad stocks, examine into market conditions and pay something in the neighborhood of current market prices. These figures appear to indicate that the same practical school-board members, when they are investing the people's money in a supposedly necessary community commodity, are, certain of them, paying prices very greatly in excess of current market prices as represented by the standards of practice in those cities that lie within the "zone of safety." It probably is sufficiently extravagant to pay even the price of $90 for its Latin, when the median city is getting it done for $71. When the same city is getting its mathematics for $59 and its English for $51, it is more than probable that the upper limit of our middle zone in this case represents wasteful extravagance; and that it is the lower portion of the middle zone that more nearly represents safety.

The administrative readjustments necessary for bringing costs within the limits of the zone of middle practice must concern themselves chiefly with the size of classes, with length of recitation periods, and with frequency of class meetings. Small classes can accomplish just as much per pupil with fewer meetings per week, or with shorter meetings, than the so-called standard period. In a subject where there is a tendency for classes to grow smaller in size, as is the case with the Latin at present, it is possible to organize new classes annually instead of semiannually, or even biennially instead of annually in the smaller high schools. It is easily possible for the high schools that transcend the flexible standard of the central zone of safety to bring the costs down to the standard without any


Maple Lake, Minn. 244
II. --- LATIN
Cost per 1000 student hours ---
180
University High 174
170
Russell, Kan. 170
160
150
140
Elgin 138
130
Mishawaka 126
120
110
San Antonio 103
100
Q3 - 98
90
Harvey 92
South Bend 86
East Chicago 84
80
Junction City 73
Leavenworth 75
De Kalb 74
M - 71
70
Washington 68
East Aurora 64
Mt Carroll 62
Waukegan 61
Noblesville 61
60
Brazil 54
Q1 - 53
Morgan Park 53
50
Rockford 49
Granite City 52
Norfolk 48
Boonville 48
Greensburg.
40

loss in educational results when measured by the results obtained in the cities of the middle zone. These readjustments will necessitate the provision for a larger amount and certainly a desirable amount of flexibility in current standards relating to size of classes, length of periods, and number of periods per week, in small accredited high schools. The present rigidity is inimical to administrative efficiency.

ENGLISH

English is a subject of instruction in which the content is much less completely standardized than mathematics or Latin, yet we find the diversity of costs and therefore the diversity of administrative practices to be somewhat less. Table III shows that the median cost is $51. It is much less expensive than Latin or mathe-

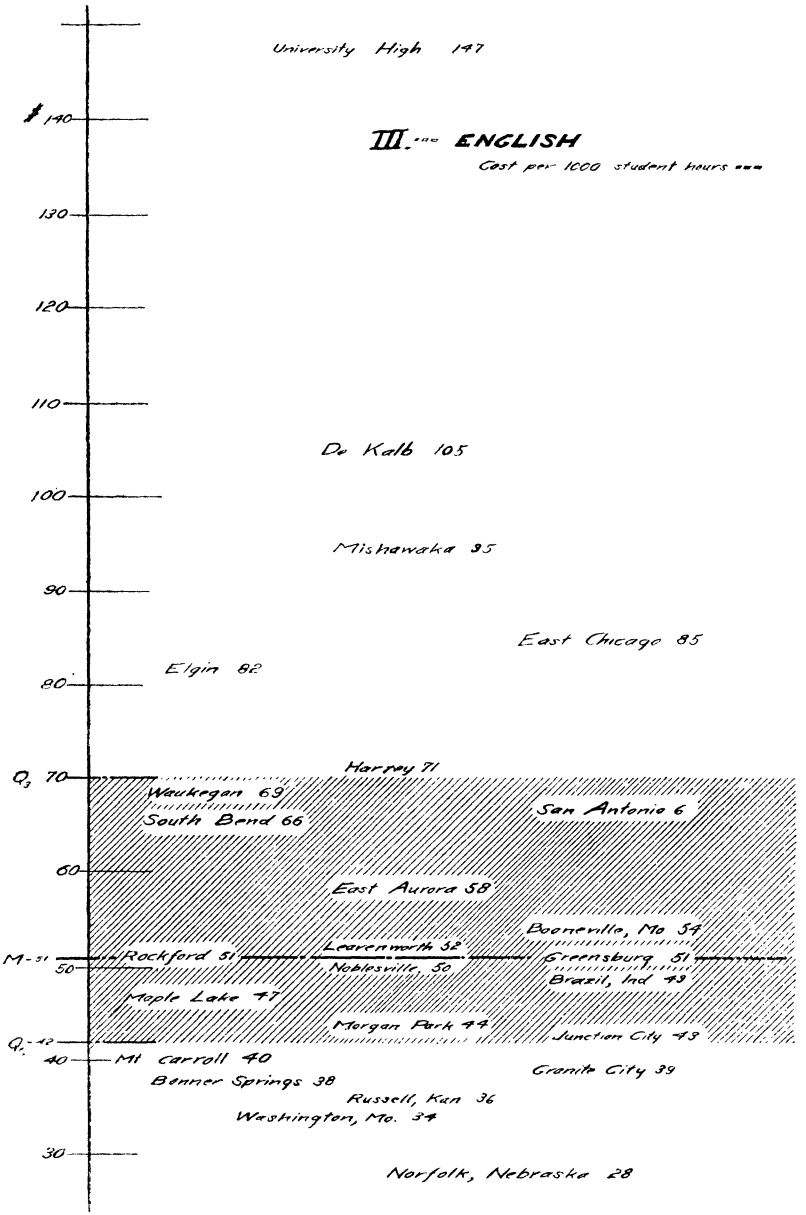
TABLE III

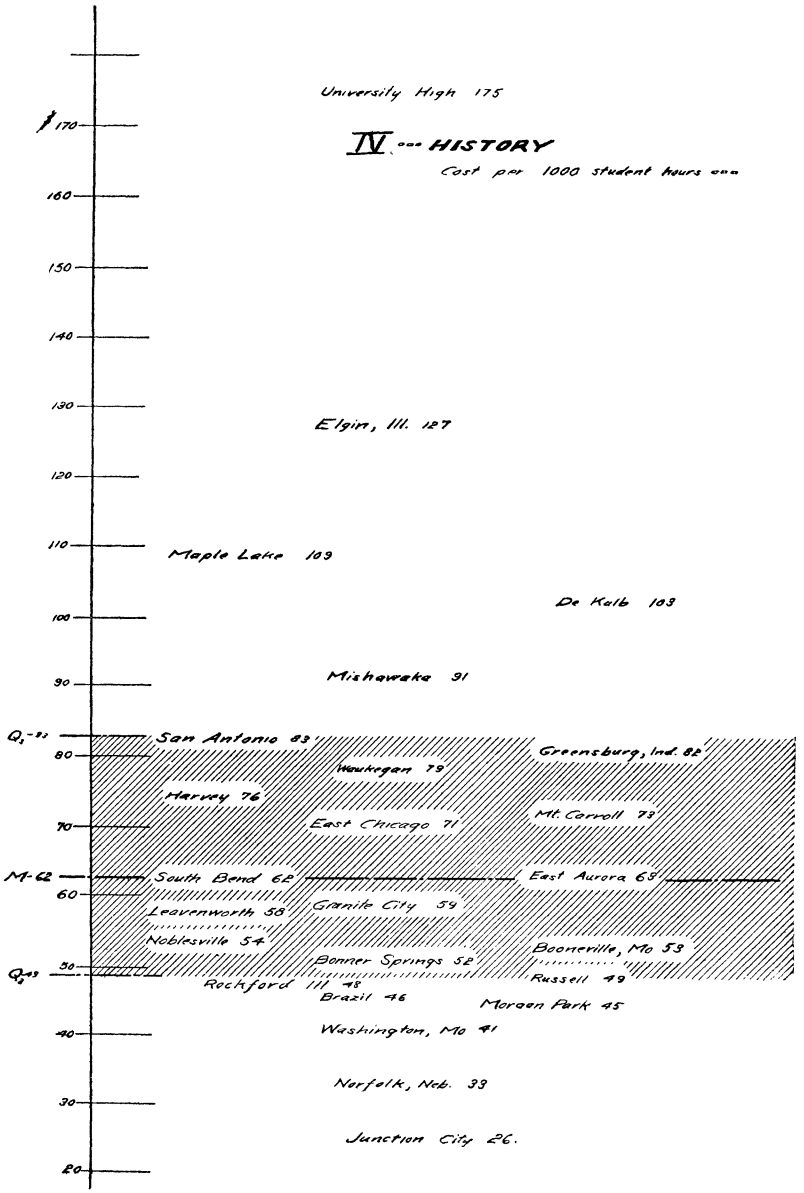
ENGLISH.—COST OF INSTRUCTION IN HIGH-SCHOOL LATIN PER 1,000 STUDENT-HOURS, 1913

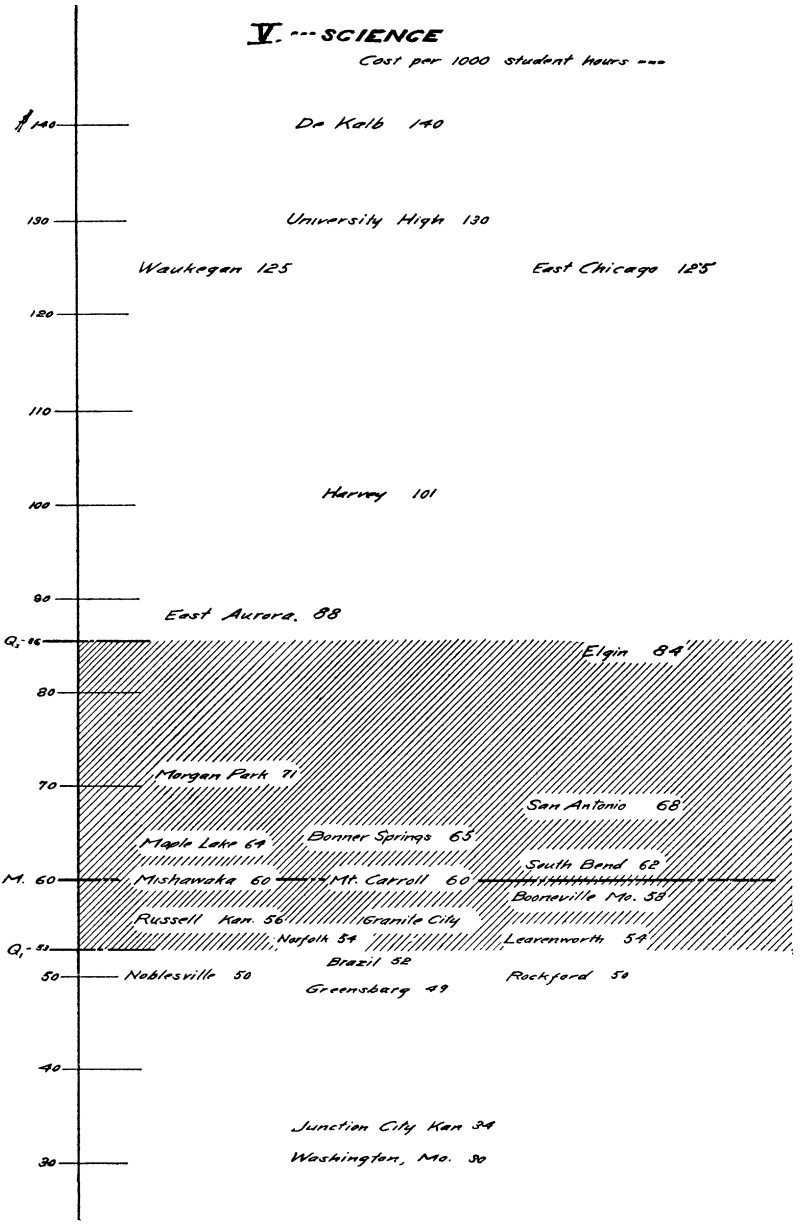
	Cost per 1,000 Student-Hours
University High	$147
DeKalb, Ill	105
Mishawaka, Ind	95
East Chicago, Ind	85
Elgin, Ill	82
Harvey, Ill	71
Waukegan, Ill	69
San Antonio, Tex	67
South Bend, Ind	66
East Aurora, Ill	58
Booneville, Mo	54
Leavenworth, Kan	52
Rockford, Ill	51
Greensburg, Ind	51
Noblesville, Ind	50
Brazil, Ind	49
Maple Lake, Minn	47
Morgan Park, Ill	44
Junction City, Kan	43
Mt. Carroll, Ill	40
Granite City, Ill	39
Bonner Springs, Kan	38
Russell, Kan	36
Washington, Mo	34
Norfolk, Neb	28

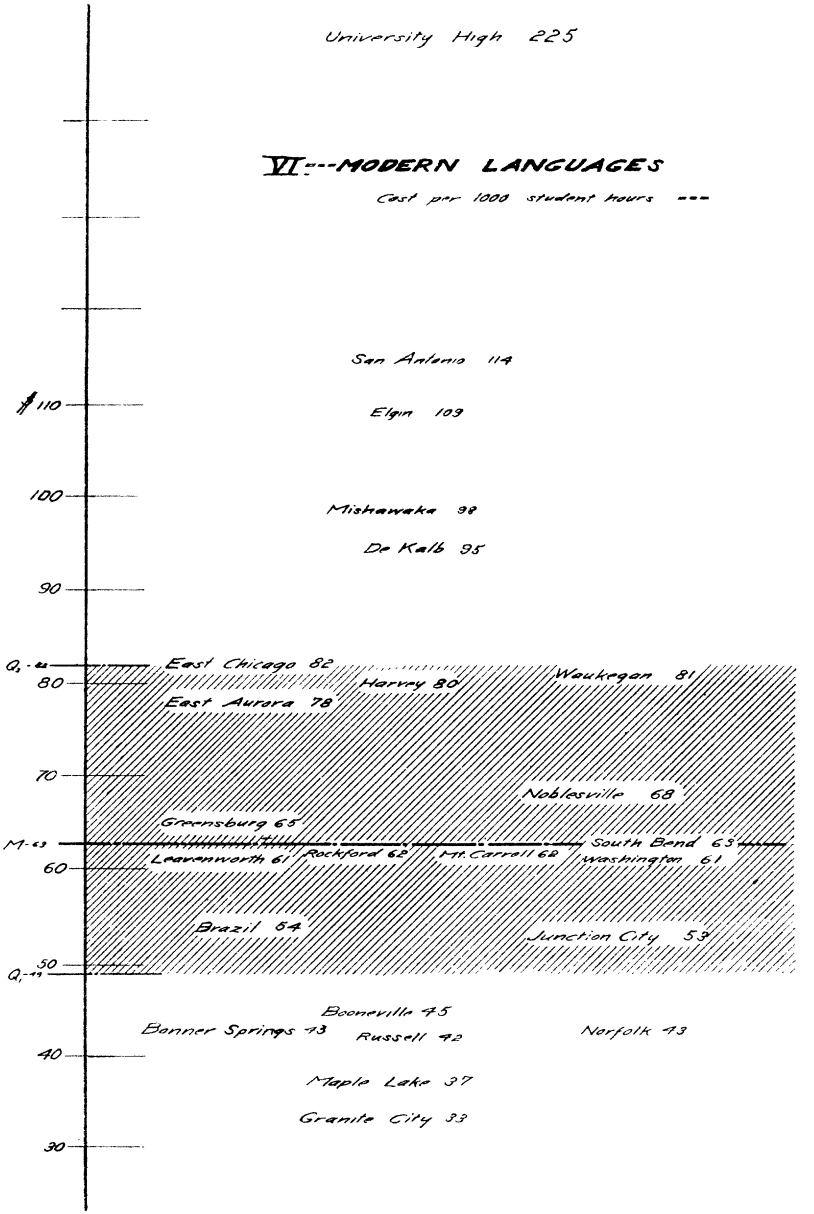
matics. The entire zone of safety falls below the median price of the Latin. Cities are paying less probably, not because the English is worth less, but because in obedience to unduly rigid administrative requirements it is possible to make desirable administrative adjustments in a subject like English which all students take, that under present conditions are not possible in a subject like Latin, which is taken by only a portion of the students. While we are here finding standards of judgment for the administration of the individual subjects within those subjects themselves, yet there is clear justification for using in subjects like Latin and mathematics standards not greatly dissimilar to those of English. It is altogether probable that the lower median and zone of flexibility valid for English instruction should be valid also for mathematics or Latin.

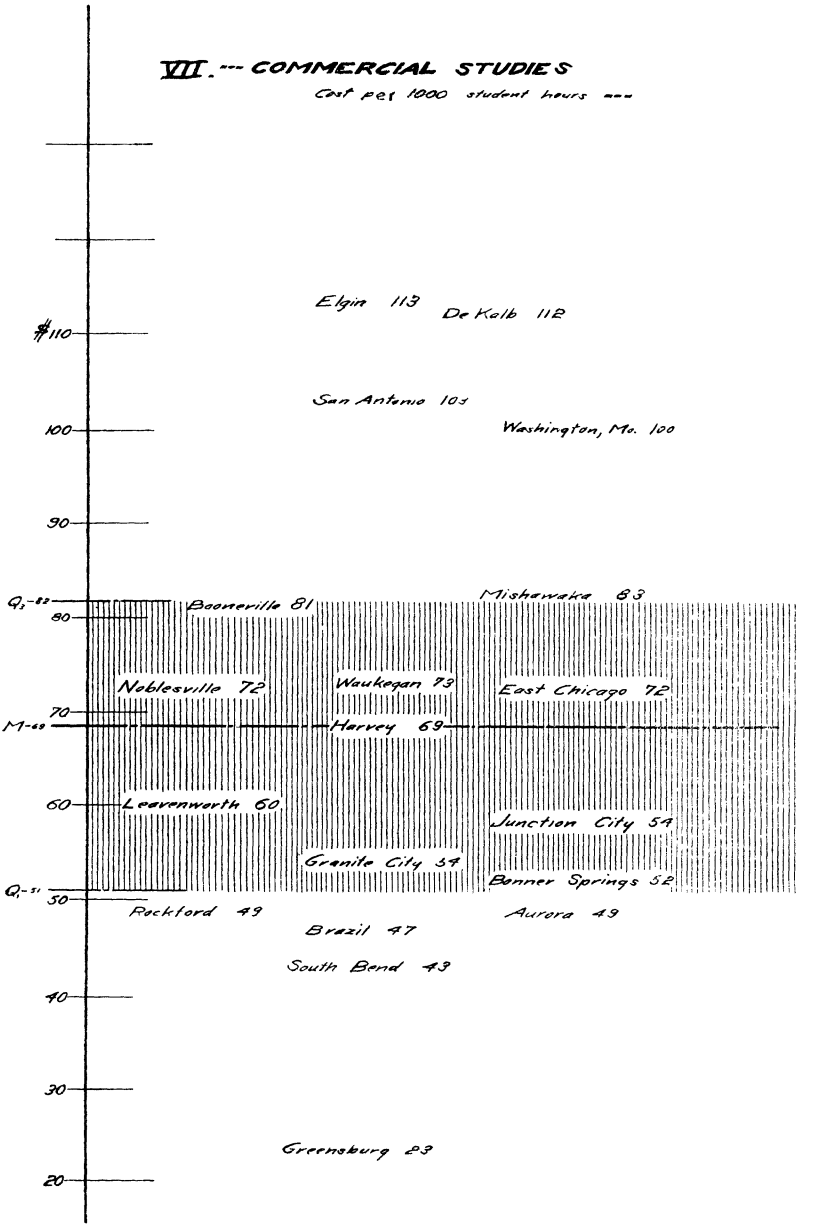
Owing to the fact that current practice is so different in different subjects it is necessary to determine medians and zones of central range for each of the different studies separately. The conditions surrounding certain of the subjects, as for example manual training, music, science, etc., differ so greatly that it is not desirable that classes should be of the same size, or that instructors should always have the same number of hours of class work per day. The salary situation likewise differs with the subject taught. The charts that follow indicate the situations with reference to each of the more common high-school subjects so far as the data at hand can reveal such situations.

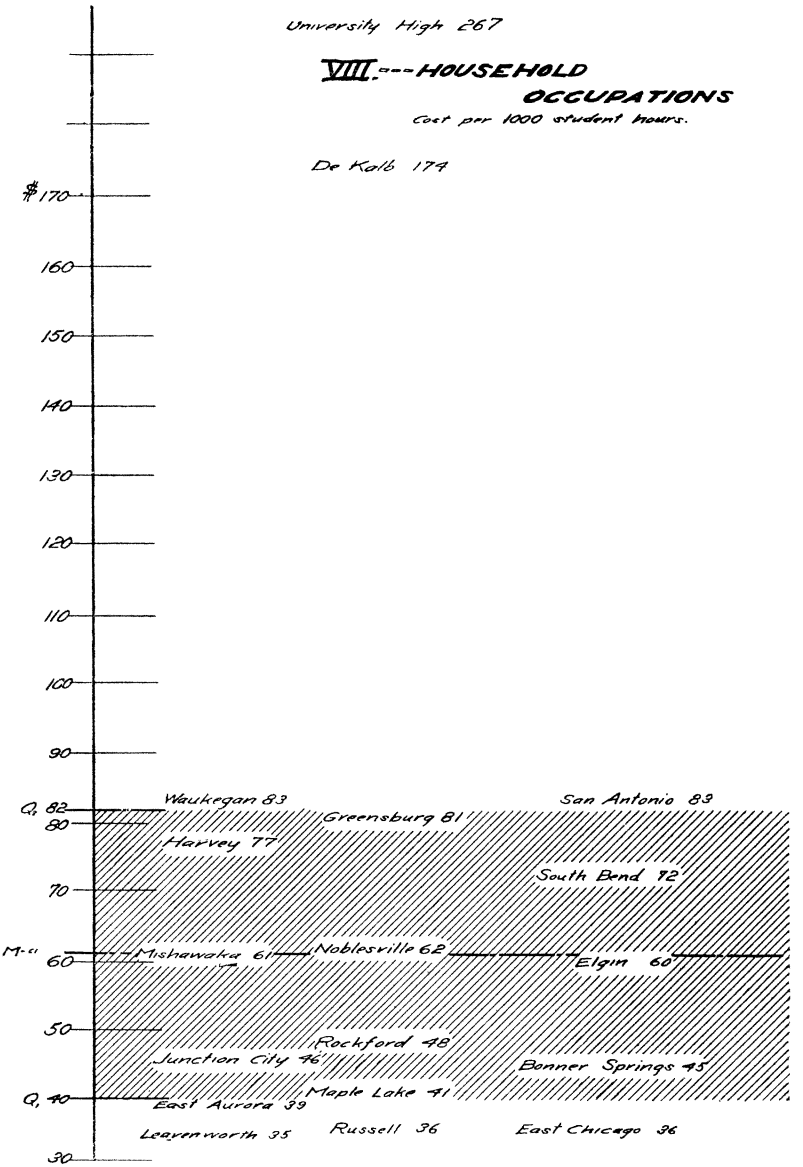

University High 197
III.—ENGLISH
Cost per 1000 student hours
140
130
120
110
100
90
80
70
60
50
40
30
De Kalb 105
Mishawaka 95
East Chicago 85
Elgin 82
Harvey 71
Waukegan 69
South Bend 66
San Antonio 6
East Aurora 58
Boonville, Mo 54
Leavenworth 52
Greensburg 51
Rockford 51
Noblesville, 50
Brazil, Ind 49
Maple Lake 47
Morgan Park 44
Junction City 43
Mt Carroll 40
Granite City 39
Bonner Springs 38
Russell, Kan 36
Washington, Mo. 34
Norfolk, Nebraska 28

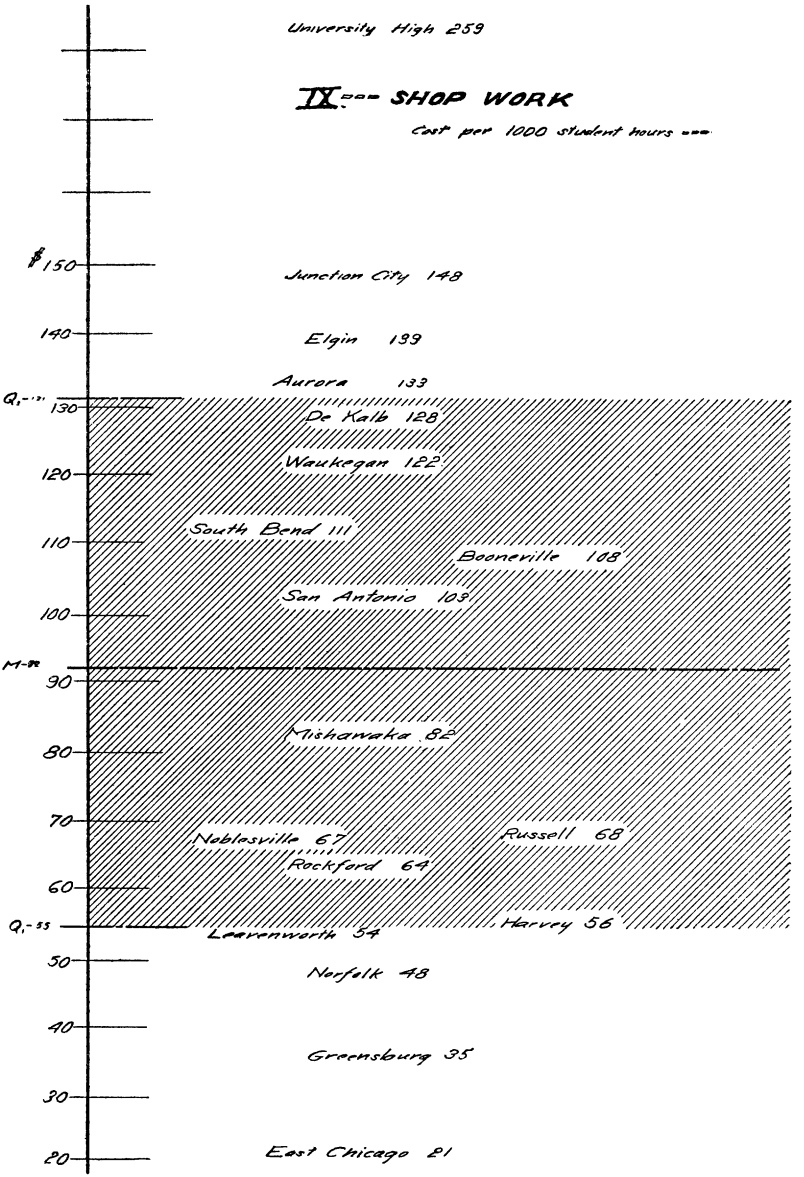

University High 175
IV --- HISTORY
Cost per 1000 student hours ---
170
160
150
140
130
Elgin, Ill. 127
120
110
Maple Lake 109
De Kalb 103
100
90
Mishawaka 91
Q1-93
San Antonio 83
Greensburg, Ind. 82
80
Waukegan 79
Harvey 76
70
East Chicago 71
Mt. Carroll 73
M-62
South Bend 62
East Aurora 69
60
Leavenworth 58
Granite City 59
Nobleswille 54
Boonerville, Mo 53
Q3-43
50
Bonner Springs 52
Russell 49
Rockford Ill 48
Brazil 46
Moraon Park 45
40
Washington, Mo 41
Norfolk, Neb. 33
30
Junction City 26.
20

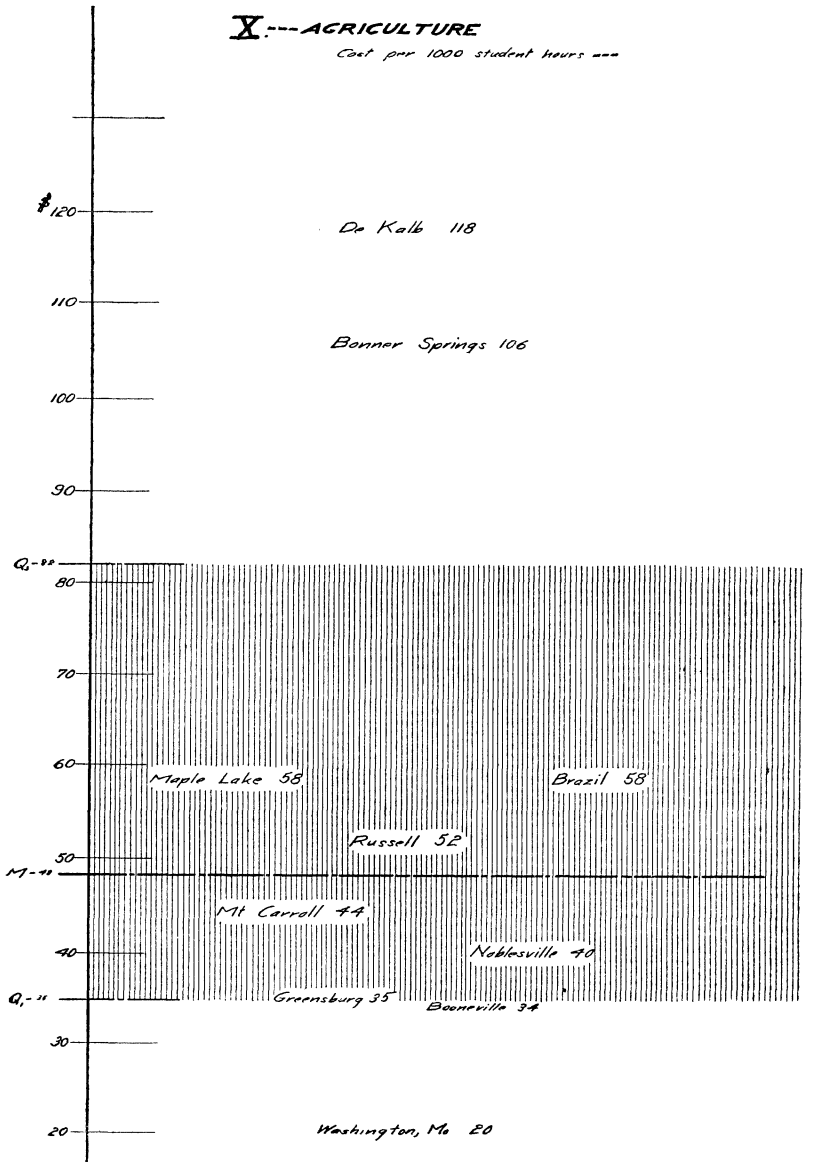

V. --- SCIENCE
Cost per 1000 student hours ---
140
130
120
110
100
90
80
70
M. 60
50
40
30
De Kalb 140
University High 130
Waukegan 125
East Chicago 125
Harvey 101
East Aurora. 88
Elgin 84
Morgan Park 71
San Antonio 68
Maple Lake 64
Bonner Springs 65
South Bend 62
Mishawaka 60
Mt. Carroll 60
Booneville Mo. 58
Russell Kan. 56
Granite City
Norfolk 54
Learenworth 54
Brazil 52
Noblesville 50
Rockford 50
Greensburg 49
Junction City Kan 34
Washington, Mo. 30

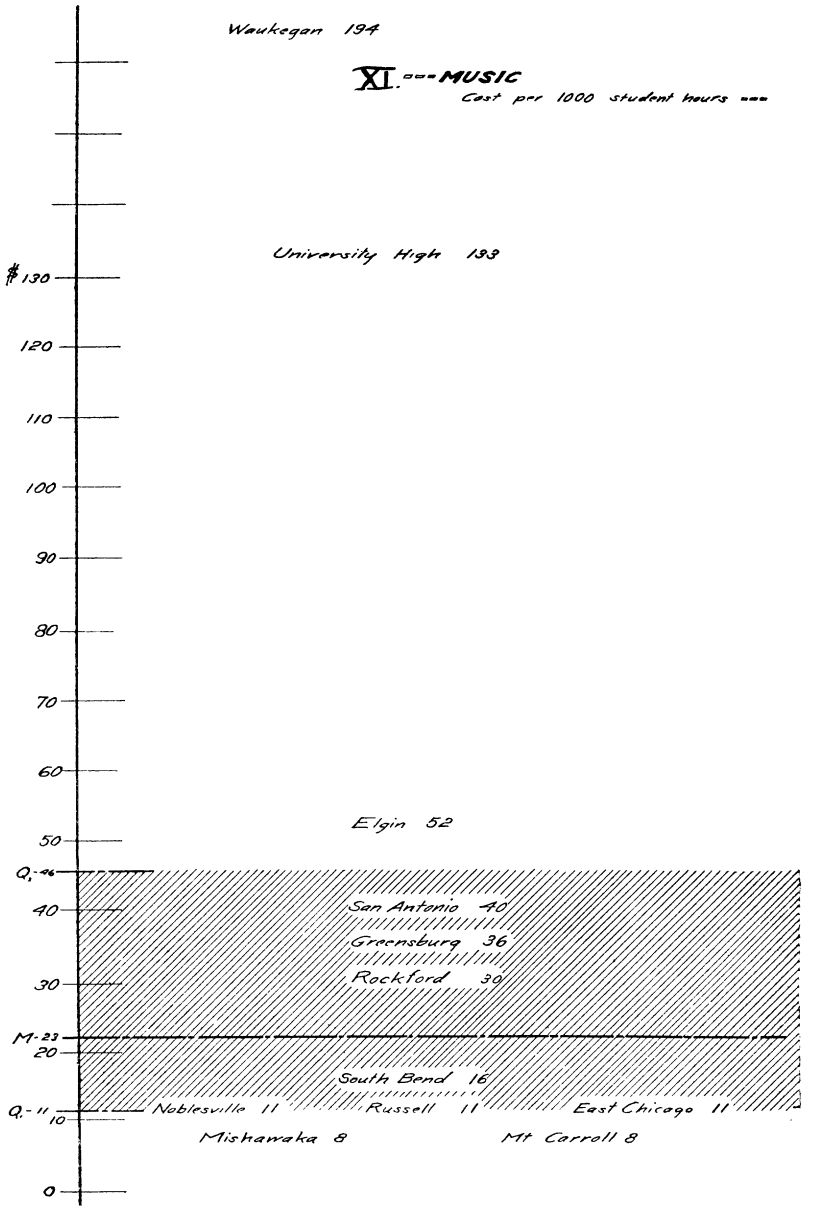

University High 225
VI.---MODERN LANGUAGES
Cost per 1000 student hours ---
San Antonio 114
Elgin 103
110
Mishawaka 98
De Kalb 95
100
90
Q3 - 82
East Chicago 82
80
Harvey 80
Waukegan 81
East Aurora 78
70
Noblesville 68
Greensburg 65
M - 63
South Bend 63
Leavenworth 61
Rockford 62
Mt. Carroll 62
Washington 61
60
Brazil 54
Junction City 53
Q1 - 49
50
Booneville 45
Banner Springs 43
Russell 42
Norfolk 43
40
Maple Lake 37
Granite City 33
30

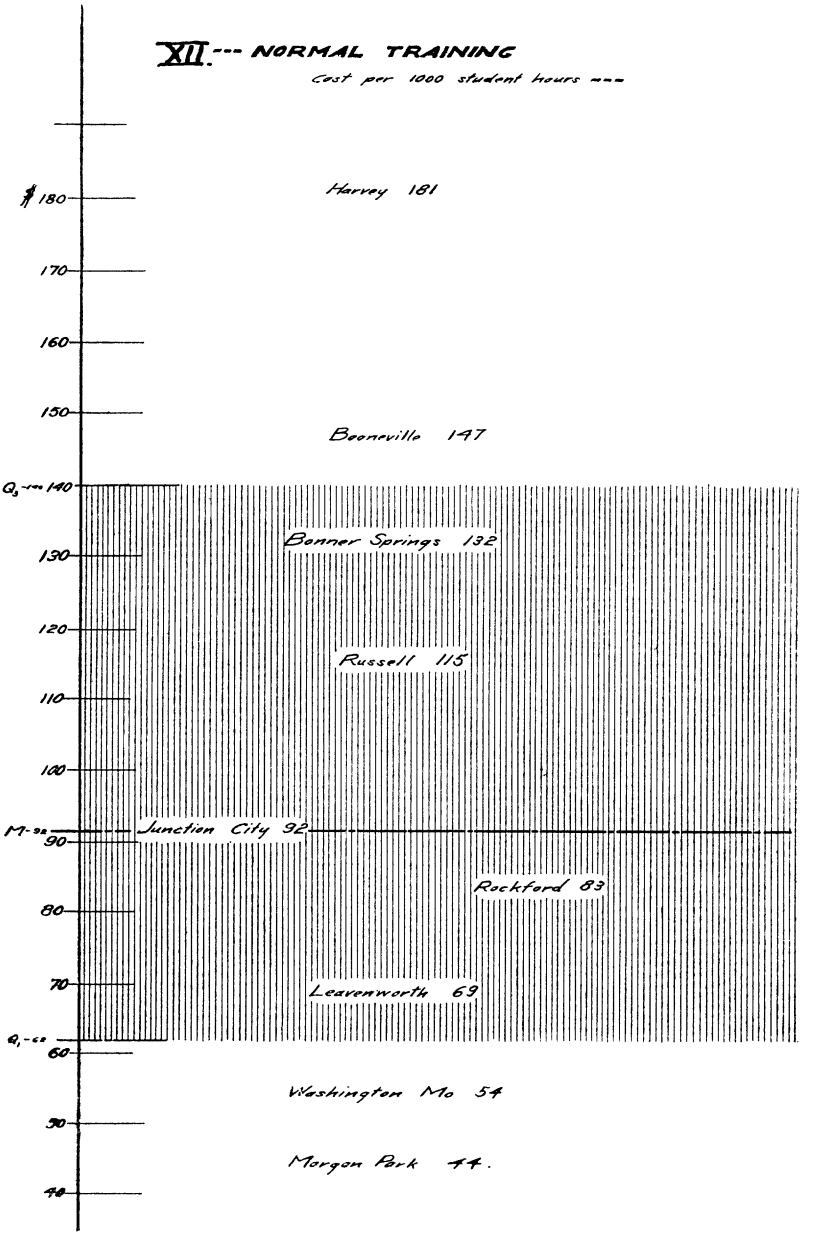

VII. --- COMMERCIAL STUDIES
Cost per 1000 student hours ---
Elgin 113
DeKalb 112
San Antonio 103
Washington, Mo. 100
Mishawaka 83
Boonville 81
Noblesville 72
Waukegan 73
East Chicago 72
Harvey 69
Leavenworth 60
Junction City 54
Granite City 54
Bonner Springs 52
Rockford 49
Aurora 49
Brazil 47
South Bend 43
Greensburg 23
110
100
90
80
70
60
50
40
30
20


University High 267
VIII.---HOUSEHOLD OCCUPATIONS
Cost per 1000 student hours.
De Kalb 179
$
170
160
150
140
130
120
110
100
90
Q. 82
80
70
M-
60
50
Q. 40
30
Waukegan 83
Greensburg 81
San Antonio 83
Harvey 77
South Bend 82
Mishawaka 61
Noblesville 62
Elgin 60
Rockford 48
Junction City 46
Bonner Springs 45
Maple Lake 41
East Aurora 39
Leavenworth 35
Russell 36
East Chicago 36

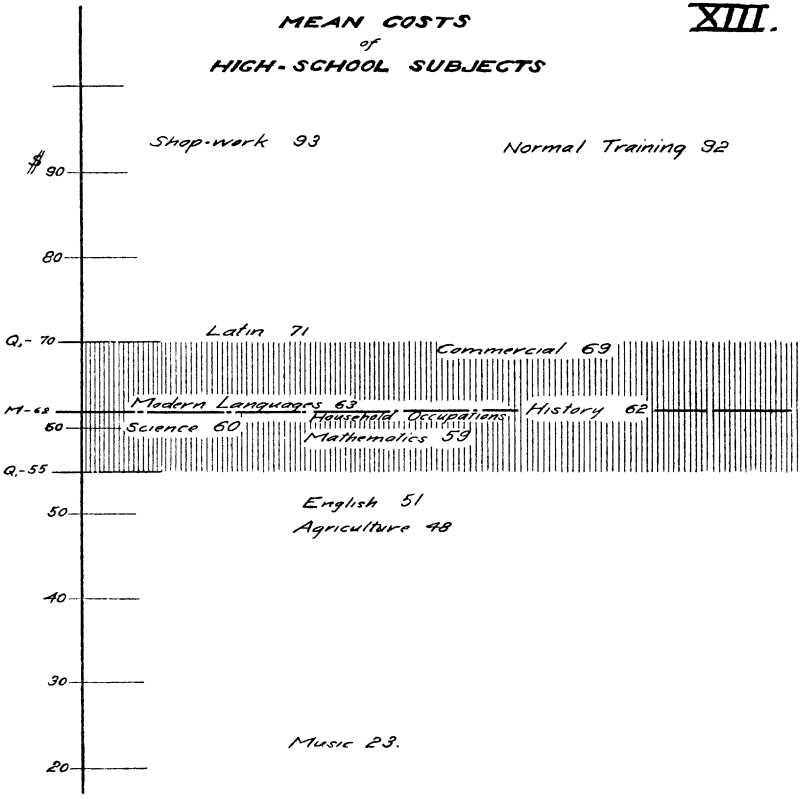

University High 259
IX.--- SHOP WORK
Cost per 1000 student hours ---
$150
Junction City 148
140
Elgin 139
Aurora 133
Q1-75
130
De Kalb 128
Waukegan 122
120
South Bend 111
110
Booneville 108
San Antonio 103
100
M-98
90
Mishawaka 82
80
70
Noblesville 67
Russell 68
Rockford 64
60
Q1-55
Leavenworth 54
Harvey 56
50
Norfolk 48
40
Greensburg 35
30
East Chicago 21
20


X.---AGRICULTURE
Cost per 1000 student hours ---
120
110
100
90
80
70
60
50
40
30
20
De Kalb 118
Bonner Springs 106
Maple Lake 58
Brazil 58
Russell 52
Mt Carroll 44
Noblesville 40
Greensburg 35
Boonville 34
Washington, Mo 20


Waukegan 194
XI. ---MUSIC
Cost per 1000 student hours ---
University High 193
$130
120
110
100
90
80
70
60
Elgin 52
50
Q3-46
40
San Antonio 40
Greensburg 36
Rockford 30
M-23
30
20
South Bend 16
Q1-11
10
Noblesville 11
Russell 11
East Chicago 11
Mishawaka 8
Mt Carroll 8
0


XII.--- NORMAL TRAINING
Cost per 1000 student hours ---
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
Harvey 181
Beaneville 147
Bonner Springs 132
Russell 115
Junction City 92
Rockford 83
Leavenworth 69
Washington Mo 54
Morgan Park 44.

The variety of prices paid for the same quantity of instruction in the various subjects is shown in Table IV and Chart XIII. The subject of median cost stands at $62. The middle zone of variability shows a range from $55 to $70. For those that now stand above this zone of normal variability it is possible that administrative readjustments are desirable for the purpose of bringing them down and thus eliminating waste. For those below this normal range of variability classes need to be cut down in size, teachers better paid, or the teaching week shortened, so as to bring them at least nearer the range of normality. In other words, just as it is possible to determine standard costs for each of the various subjects separately out of the practical situations where those subjects are taught, so it may be possible to determine flexible



standards of cost for the entire situation applicable to the entire range of subjects. Whether or not this can be profitable can be known only after such standards have been derived for high schools of homogeneous classes and involving large numbers. After the matter has been tried out its worth can be known.

TABLE IV

MEAN COST AND "ZONES OF SAFETY"

	Median Cost 1,000 Student-Hours	"Zone of Safety"
Shopwork	$93	$55–$131
Normal training	92	62– 140
Latin	71	54– 98
Commercial	69	51– 82
Modern languages	63	49– 82
History	62	49– 83
Household occupations	61	40– 82
Science	60	53– 86
Mathematics	59	47– 78
English	51	42– 70
Agriculture	48	35– 58
Music	23	11– 46

SIZE OF CLASSES

When a city finds itself paying an exceptional amount per 1,000 student-hours, whether high or low, one of the things in which corrective readjustment is possible is the size of classes. This raises the question of what is the proper size of class for the teaching of each of the different subjects. While arbitrary standards have been set up, yet as a matter of fact nobody knows what is the proper size of classes, either from experiment or from a study of the consensus of practice covering wide areas. The present study, based upon only the twenty-five high schools of heterogeneous size and situation, indicates that the number of pupils per class in every subject varies greatly. Table V shows the situation in English and mathematics in these twenty-five high schools. Although most of them are aiming at much the same results, yet the high schools with small classes are consuming more than twice as much of the teaching time and energy per pupil as the larger classes.

For English, the table shows a central range of 21 to 24 pupils per class. Were standards based upon conditions in a large number of schools of homogeneous class, then it would be safe to conclude that those at the top of the entire list are probably too large, while

TABLE V

AVERAGE SIZE OF CLASSES IN ENGLISH AND MATHEMATICS IN THE TWENTY-FIVE HIGH SCHOOLS

ENGLISH		MATHEMATICS	
School	No. Pupils	School	No. Pupils
Mishawaka	31	Mishawaka	29
San Antonio	28	Greensburg	27
Greensburg	26	San Antonio	27
Norfolk	26	Junction City	27
Harvey	25	Rockford	25
University	25	Norfolk	25
Leavenworth	24	Waukegan	24
Morgan Park	24	Leavenworth	23
South Bend	24	Morgan Park	23
Rockford	23	Noblesville	23
Elgin	23	Russell	22
Noblesville	22	South Bend	22
Russell	22	Harvey	21
East Aurora	22	Mt. Carroll	21
Junction City	21	Elgin	20
Granite City	21	East Aurora	19
Waukegan	21	University	19
Brazil	21	Brazil	19
Bonner Springs	20	Bonner Springs	19
Mt. Carroll	20	DeKalb	18
DeKalb	18	Booneville	18
Booneville	18	Granite City	16
East Chicago	16	East Chicago	15
Washington, Mo	15	Maple Lake	13
Maple Lake	14	Washington, Mo	12

those at the very bottom of the series are certainly too small for administrative economy. For the sake of educational efficiency the larger classes may need to be somewhat diminished, and for the sake of administrative economy the smaller classes need to be combined into larger ones, or, where this is impossible, adjusted as to

the number of meetings per week or the length of meeting, so that these matters will correspond with the diminished size of the class. The variation in size of classes in mathematics indicates likewise the necessity of using the standards of central practice as the basis for administrative adjustment.

The variation in the size of classes shown in English and mathematics is equally marked in the case of every other subject. It is in fact considerably greater in certain of the subjects in which the content of the work is less fully standardized. Table VI shows the

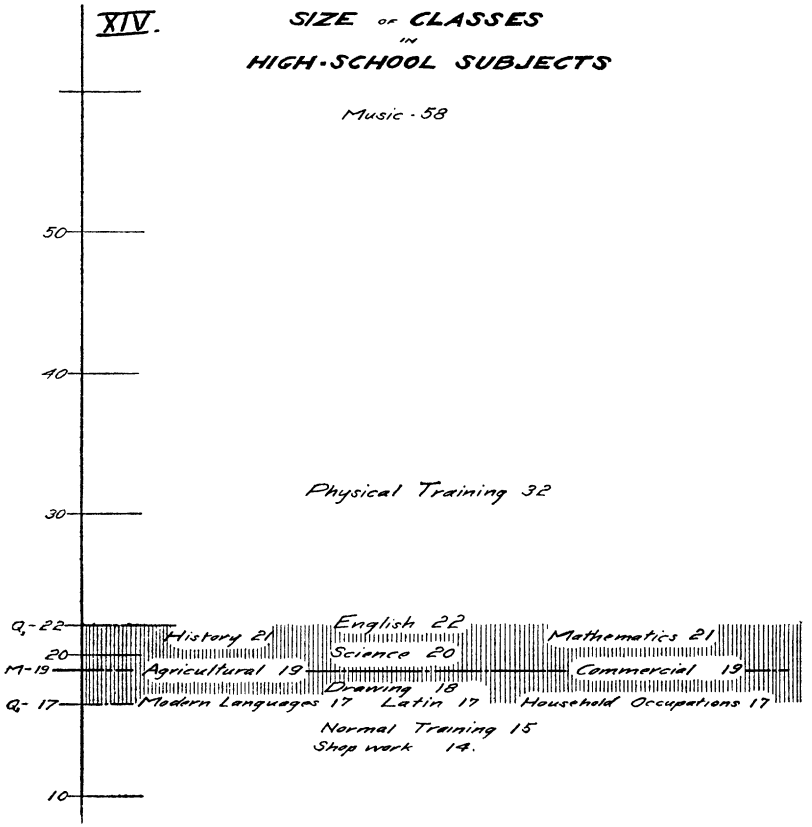
TABLE VI

SIZE OF CLASS BY SUBJECTS

	Median No. Pupils	"Zone of Safety"
Music	58	42–88 pupils
Physical training	32	28–55 "
English	22	20–24 "
Mathematics	21	18–24 "
History	21	17–23 "
Science	20	16–22 "
Agriculture	19	18–25 "
Commercial	19	15–23 "
Drawing	18	14–24 "
Modern languages	17	15–20 "
Latin	17	14–19 "
Household occupations	17	13–23 "
Normal training	15	10–21 "
Shopwork	14	12–18 "

median size of class in each of the various subjects. It also shows the range of the middle 50 per cent of the schools for each of the subjects. The table shows rather clearly why shopwork and normal training are so very expensive per 1,000 student-hours as compared with mathematics or English. It shows why English costs on an average only about 70 per cent as much as Latin for the same number of student-hours. It is clear that in these high schools classes in certain subjects need to be increased in size, or time expenditures decreased in amount. Chart XIV shows rather more

clearly than the table the relative positions of the different subjects in the matter of the size of classes.



LENGTH OF TEACHING WEEK

The number of hours per week per teacher actually devoted to the teaching of a given subject differs greatly in different high schools. For this also standards of current practice are needed. Table VII shows the diversity of practice to be found among these twenty-five high schools in the subjects of English and mathematics. While the average length of week for both of these subjects is between 23 and 24 hours, the variations upward and downward are very considerable. It must be mentioned that the

time here includes that which is devoted to supervision of the study-room. It does not include outside work or unassigned time at the school. It covers the time given to classes and to study-room.

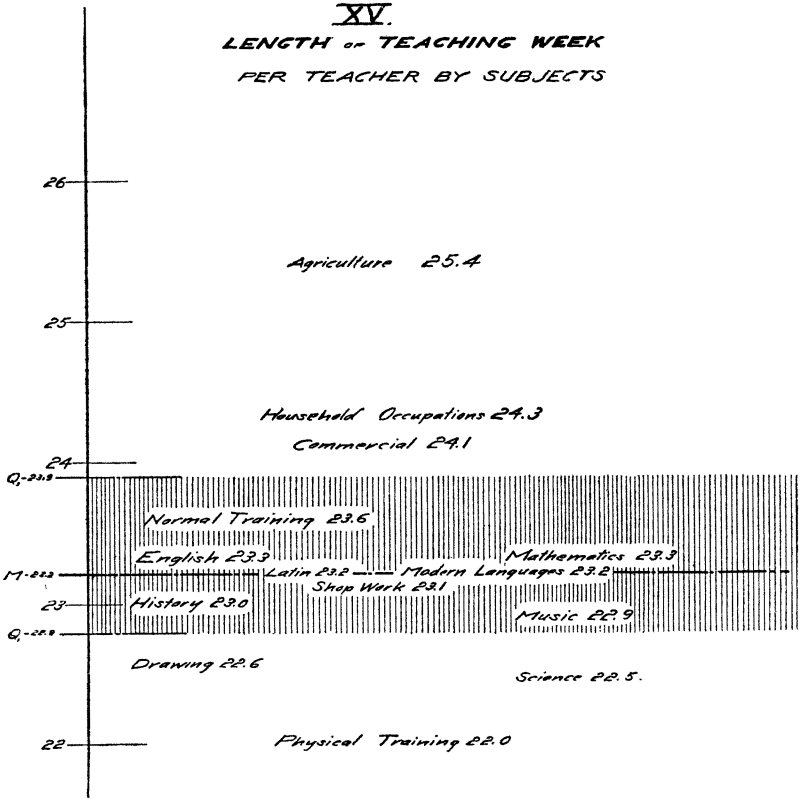
TABLE VII

LENGTH OF TEACHING WEEK IN 60-MINUTE HOURS PER TEACHER IN ENGLISH AND MATHEMATICS

ENGLISH		MATHEMATICS	
School	Hours Weekly per Teacher	School	Hours Weekly per Teacher
Washington, Mo	30	Washington, Mo	30
Elgin	28	Mishawaka	30
Mishawaka	27	Elgin	28
Bonner Springs	27	Noblesville	27
Norfolk	27	Russell	27
Russell	27	Booneville	24
Maple Lake	26	Morgan Park	24
Granite City	26	Bonner Springs	24
Noblesville	25	Granite City	23
Booneville	24	Brazil	23
Morgan Park	24	San Antonio	23
Junction City	23	Mt. Carroll	23
Mt. Carroll	23	Junction City	23
San Antonio	22	East Chicago	23
Rockford	22	Rockford	23
Brazil	22	Maple Lake	23
East Aurora	21	East Aurora	23
DeKalb	21	DeKalb	23
Waukegan	20	Norfolk	22
Leavenworth	20	Harvey	22
East Chicago	19	Waukegan	20
Greensburg	19	Leavenworth	20
Harvey	18	South Bend	20
South Bend	18	Greensburg	18
University	15	University	15

In making administrative readjustments by way of regulating unit costs, it would appear desirable in the case of certain of the high schools to lengthen the teaching day of the teachers. If the consensus of practice is indicative of right adjustments, then certain other high schools need to diminish the length of the teaching

day. In certain schools the teachers seem to be underworked, while in others they seem to be overworking. This is of course upon the presumption that all of these high schools are aiming at the same kind of results in the various subjects. Since the needs of youth are much the same everywhere in amount and quality of training the assumption would seem to be a fair one.



The variations in the length of the teaching week noted in the case of English and mathematics are to be found in all of the subjects. Table VIII shows the median length of teaching week in sixty-minute hours for each of the various subjects, and also the quartile range for each of the subjects. It shows where consensus of practice places the longer week and where it places the shorter week.

TABLE VIII

LENGTH OF TEACHING WEEK PER TEACHER BY SUBJECTS

	Hours (60 Minutes) per Teacher per Week	"Zone of Safety"
Agriculture	25.4	23–28 hours
Household occupations	24.3	21–28 "
Commercial	24.1	23–27 "
Normal training	23.6	20–27 "
English	23.3	20–26 "
Mathematics	23.3	22–26 "
Latin	23.2	21–26 "
Modern languages	23.2	20–26 "
Shopwork	23.1	21–26 "
History	23.0	20–26 "
Music	22.9	15–25 "
Drawing	22.6	21–27 "
Science	22.5	20–25 "
Physical training	22.0	19–25 "

TEACHERS' SALARIES

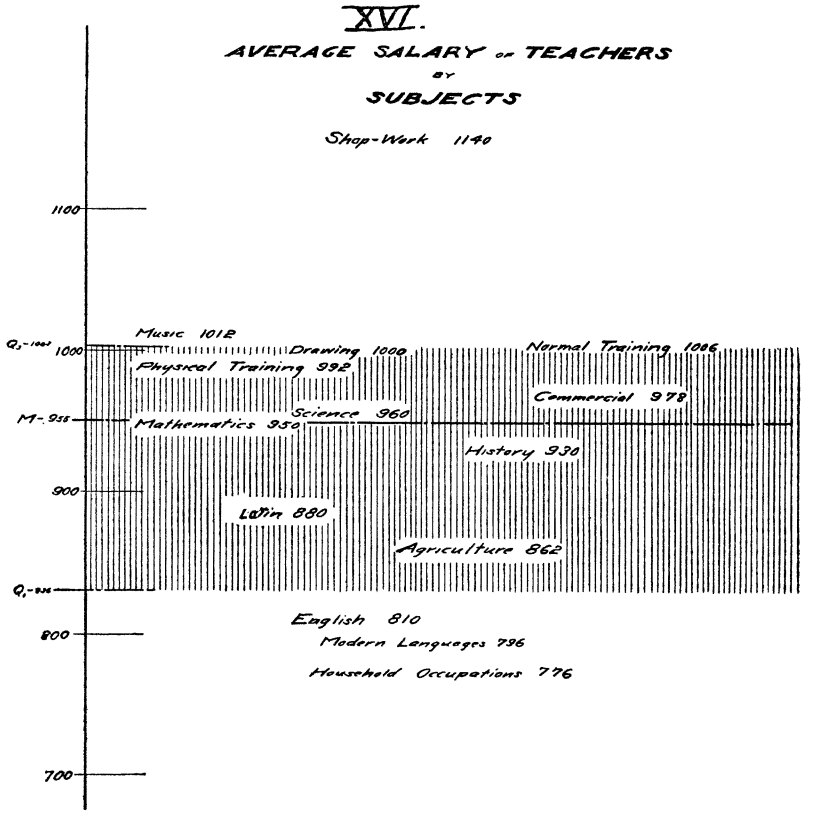
That the unit costs in these twenty-five cities vary because of differences in the teachers' salaries is sufficiently well known. In English, for example, salaries vary from $650 to $1,800; in mathe-

TABLE IX

AVERAGE SALARY OF TEACHERS BY SUBJECTS

Shopwork	$1,140
Music	1,012
Normal training	1,006
Drawing	1,000
Physical training	992
Commercial	978
Science	960
Mathematics	950
History	930
Latin	880
Agriculture	862
English	810
Modern languages	796
Household occupations	776

matics the variation is from $600 to $1,650; and so on through the entire list of subjects. Table IX shows that the standard cost of different subjects is due in considerable measure to differences in the average salary paid. The most expensive subject per thousand



student-hours is manual training. For this too the average salary paid is the highest. A general dissemination of information as to the average salaries paid for different subjects ought to have in time an influence in regulating the supply of teachers so as more nearly to equate the salaries paid. None of these average salaries are high, but it is difficult to justify the difference between household occupations at one end of the scale and shopwork at the other.

There probably can be no real reasons for paying teachers of English and of modern languages so much less than teachers of mathematics and science, except that the supply of teachers for English is greater than the supply for the other subjects. Science and mathematics are so much less remunerative than shopwork for the same reason. While all salaries ought to rise, the equation of salaries can be brought about automatically by a general diffusion of information as to the different levels of remuneration in the teaching of different subjects, thus encouraging fewer to take the subjects which pay less and encouraging more to take the subjects that pay more.

Chart XVI shows graphically the different levels of salaries for the different subjects. The subject needs to be worked out carefully for the high schools of the whole country, and classified regionally and by size of high school or of city in which located.